Strategies for Systems Intensification

AHI brief

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Lushoto, Tanzania: Conservation strips of fodder, with more intensive water management and banana and tomato production in terraces.

Through interdisciplinary teamwork and linked technological innovations, farmers have begun to break through adoption barriers.

Linked Technologies for Increasing Adoption and Impact

AHI has the challenging task to contribute towards improving livelihoods and environment in the intensively cultivated highlands of eastern Africa. During pre- and post-colonial eras, conservation technologies were promoted under conservation programs and agricultural production improvement technologies by agricultural research institutes. Separating conservation and agriculture, and piecemeal promotion of technologies and management practices ("commodity" or "single factor" approach), did not create impact.

AHI has had success in using an integrated, participatory approach where there has been an explicit effort to link conservation with production-enhancing technologies. This has resulted in more investment in natural resource management (NRM) by farmers, more sustainable production systems, extra produce for marketing, and greater revenue via taxes for district development.

Hypotheses

✔ Technologies with immediate benefits, used as entry points, will build farmers' confidence to test more complex NRM technologies, and strengthen the demand side.

✔ Problem-solving participatory research approaches and win-win technologies will help farmers of different resource endowments to solve multiple problems, with solutions attractive enough to "sell" to others.

✔ Strategies that strive to increase income while addressing complex NRM issues will attract a range of partners interested in R&D agendas of the rural poor.

Steps and Outcomes

1. Identification of "entry points" with pilot communities
Research teams engaged communities by starting with simple-to-solve but high priority needs. Through focus group discussions farmers identified key constraints and underlying causes, as well as social and biophysical niches in their farming systems, and set priorities. Researchers used key informants for "resource endowment ranking" to understand endowments and associated needs.

2. Organizing research inputs
The research team then brought in expertise to address the priorities and managed theme task forces on: sustainable intensification and diversification, integrated soil and water management, improving dissemination, and policy issues. A Site Coordinator maintained integration of research inputs, teamwork, and uniformity in methods.

3. Participatory testing of a wide range of technologies by farmer groups
Farmers formed "interest groups" who led a large number of experiments to test and select sets of technologies. Groups periodically shared information and wider group assessment techniques were used to get input on what was selected and why.

4. Linking technologies
The AHI Regional Technical Support Group emphasized and built capacity of the national pilot site R&D teams to use a systems approach, address needs of diverse social groups, integrate technologies, and work as a team. Farmers played a key role in linking technologies.

Lushoto, Tanzania

Adoption patterns demonstrate the importance of linking conservation and soil fertility measures, food and fodder legumes, and new crop varieties:

✔ Conserved terraces encourage intensified water management and cash crop production.

✔ Bench terraces secured by fodder and with early application of organic inputs to offset decline in fertility associated with the coverage of fertile topsoil.

✔ Cash crop production encourages higher input application.

✔ Improved feed for livestock increases manure output and income from milk.

✔ Local source of organics—*tughutu* (Vernonia sp.) and a tree parasite—improve composts applied to cash crops (banana, vegetables, coffee).

✔ IPM of beans and other crops through local botanical pesticides and cow urine have encouraged some farmers to venture into dairy cow/goat production.

Local Impacts

✔ Increased livelihood options for farmers having diverse resource endowment levels.

✔ Synergies—conservation and livelihood goals met (increased incomes, improved NRM).

✔ Labour drawn in against the out-migration trend because livelihood options pay off.

✔ Spontaneous spread—high demand from neighbouring communities.

✔ Increased agroecosystem diversity.

✔ New concerns for research—how to manage market links, scaling up, understanding social and economic dimensions of technology adoption.

✔ Investment in local organizations (farmer research groups) have multiple pay-offs: groups go on to other endeavours and serve as platforms for discussing development issues.

Young farmer from Kwalei, Lushoto, Tanzania

"My father gave me a piece of land in order to encourage me to stay home. I wanted to get married and needed money. I looked around, talked to my neighbours, and decided to grow and market the improved cabbage variety. The plan was successful and I made 200,000 Tsh (US$220) from my first harvest."

Regional Lessons for Research

Pay-off from combining research with development objectives
Researchers worked beyond their normal mode by: building farmer collaborator capacity, having extension officers as team members, involving community members in technology assessment and field days, and accompanying farmers on exchange visits. Investment made in pilot sites has resulted in spontaneous spread of technologies.

Strategy to improve livelihood and NRM realized
Attending to short-term needs paid off—we gained farmers' trust, strengthened social capital, and addressed a range of interests. Synergies resulting from combining technical options would not have been realized with a single-factor approach. Improving income and livelihoods has to be at the forefront, although NRM improvement and equity considerations come in at all stages.

Multiple and linked technologies improved partnership arrangements and coordination
Multiple sources of expertise were sought from various research institutes, extension, farmer leaders and NGO representatives. Through joint planning and implementation, everyone gained from sharing knowledge and skills. Researchers say that this process leads to impact-oriented research by helping them to see the limitations of their own disciplinary research biases. They are now convinced that participatory methods are key in matching technologies to farmers' needs, developing appropriate technologies, and influencing their own research agendas. They feel that their institutions should reward this kind of impact-oriented research.

—Ann Stroud

Lushoto, Tanzania: Young farmer selling cabbage at road side—earning money for wedding.

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